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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/798,077

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Aleksandra Smiljanic

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HOFFMANN & BARON, LLP
6900 JERICHO TURNPIKE
SYOSSET, NY 11791

EXAMINER

LAM, HENRY S

ART UNIT

PAPER NUMBER

2609

MAIL DATE

DELIVERY MODE

08/23/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/798,077

Applicant(s)

SMILJANIC, ALEKSANDRA

Examiner

Henry Lam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-16 and 18-24 is/are allowed.
- 6) ☒ Claim(s) 17 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 28 May 2004
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

The pending claims 1-25 are presented for examination.

Claim 25 is objected.

Claim 17 is rejected

Claims 1-16, and 18-24 are allowed.

Claim Objections

1. Claim 25 is objected to because of the following informalities.

Regarding claim 25 line 7 "cells" seems to refer back to "cells recited in claim 25 line 4.

If this is true, it is suggested applicant changes "cells" to ...the cells...

Appropriate correction is required.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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3. Claim 17 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 17, ...a machine readable medium ... is not process, machine, manufacture, or composition of matter, or any new and useful improvement.
- Note: To overcome this rejection, it is suggested to applicant to change "machine readable medium" to ...a computer readable medium ...recited in claim 17.

Allowable Subject Matter

4. Claims 1-16, and 18-24 are allowed.
5. The following is a statement of reasons for the indication of allowable subject matter.
- The prior art teaches a method of load balancing, unicast and multicast, but the prior art fails to teach a method, an apparatus for balancing unicast or multicast flows in a multistage non-blocking fabric, wherein the fabric comprises at least one internal switching element (SE) stage, wherein the stage has l internal switching elements, wherein each internal switching element is associated with a unique numerical identifier, and wherein the fabric comprises an input SE stage and an output SE stage, wherein the method comprises:
- (a) grouping input ports into input sets whereby each input set consists of input ports that transmit through the same input SE, and wherein the input sets are divided into input subsets, and
 - (b) grouping output ports into output sets whereby each output set consists of output ports

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that receive cells through the same output SE, and wherein the output sets are divided into output subsets,

(c) receiving cells into the fabric wherein

if a cell is a unicast cell, then the cell is associated with an input subset i and associated with an output subset j based on the input port and the output port of the cell, else

if a cell is a multicast cell, then the cell is associated with an input subset i and associated with multiple output subsets $\{j\}$ based on the input port and the multiple output ports of the cell,

(d) assigning each cell to a flow, wherein

(i) if the cells are unicast cells, then the cells which are associated with the same input subset and associated with the same output subset are assigned to the same flow, else

(ii) if the cells are multicast cells, then the cells which are associated with the same input subset and associated with the output subsets of the same output sets are assigned to the same flow, and

(e) transmitting flows through the internal SE stage wherein cells of a particular flow are distributed among the internal switching elements, wherein the quantity of the cells of each particular flow transmitted through each internal SE differs by at most h , wherein h is positive,

wherein the number of subsets of at least one input set or at least one output set is less than n , wherein n is the number of ports of that input SE or of that output SE, and wherein N is the total number of input ports and output ports, and wherein N_f is the

maximum number of flows whose cells pass any given link, and wherein n , N , N_f , h , i , j and l are natural numbers, wherein the flow in the fabric is balanced.

A multistage non-blocking switch comprising:

- (a) at least one internal switching element (SE) stage, wherein the stage has l internal switching elements, wherein each internal switching element is associated with a unique numerical identifier,
- (b) an input SE stage,
- (c) an output SE stage,
- (d) input ports which are divided into input sets wherein each input set consists of input ports that transmit through the same input SE, and wherein the input sets are further divided into input subsets, and
- (e) output ports which are divided into output sets wherein each output set consists of output ports that receive cells through the same output SE, and wherein the output sets are further divided into output subsets, and
- (f) a flow assignment module wherein the module assigns cells which are received into the fabric to a flow, wherein the assignment comprises
 - (i) if a cell is a unicast cell, then the cell is associated with an input subset and associated with an output subset based on the input port i and the output port j of the cell, wherein cells which are associated with the same input subset and associated with the same output subset are assigned to the same flow, else
 - (ii) if a flow is a multicast flow, then each cell is associated with an input subset and associated with multiple output subsets based on the input port i and the

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multiple output ports $\{j\}$ of the cell, wherein cells which are associated with the same input subset and associated with the output subsets of the same output sets are assigned to the same flow,

whereby flows are transmitted through the internal SE stage wherein cells of a particular flow are distributed among the internal switching elements, wherein the quantity of the cells of each particular flow transmitted at each internal SE differs by at most h , wherein h is positive,

wherein the number of subsets of at least one input set or at least one output set is less than n , wherein n is the number of ports of that input SE or of that output SE, and

wherein N is the total number of input ports and output ports, and wherein N_f is the maximum number of flows whose cells pass any given link, and wherein n , N , N_f , h , L_j and l are natural numbers.

A method for balancing unicast or multicast flows in a multistage non-blocking fabric, wherein the fabric comprises at least one internal switching element (SE) stage, an input SE stage and an output SE stage, wherein the method comprises:

- (a) receiving cells into the fabric wherein each cell is associated with an input subset and associated with an output subset according to the source and destination address of the cell,
- (b) assigning each cell to a flow, wherein cells sourced from the same input subset, and bound for the same output subset, or multiple output subsets, are assigned to the same flow, and
- (c) transmitting flows through the internal SE stage wherein cells of a particular flow are

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distributed among the internal switching elements, wherein the cells of each particular flow transmitted at each internal SE differs by at most h , wherein h is positive, whereby the flow in the fabric is balanced.

6. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

McMillen (US 4,621,359), **Chalasani et al** (US 5,274,782) and **Chen et al.** (US 5,666,360) are all cited to show systems, which are considered pertinent to the claimed invention.

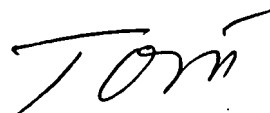
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Henry Lam whose telephone number is (571) 270-3122. The examiner can normally be reached on Monday through Thursday 8:00AM to 5:00PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dang Ton can be reached on (571) 272-3171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HL



DANG T. TON
SUPERVISORY PATENT EXAMINER